

CLAIMS:

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1. A communication system, comprising:
  - a central office (CO) of a communication service provider with xDSL modems within the CO, each modem being associated with a subscriber;
  - 5 - a plurality of subscriber premises (SPs), each equipped with one or more telephone devices connected to a telephone line of the SP and one or more devices, which can send or receive data over communication lines, the devices being connected to said telephone line by an HPN interface unit;
  - one or more local communication boxes for each group of SPs, each group
  - 10 consisting of one or more SP linked to the communication box by local wirings;
  - a twisted pair subscriber telephone line linking each SP-associated xDSL modem with the local box of said SP; and
  - at least one subscriber converter included within the local box, each of which is associated with one SP that is connected to said box, the subscriber
  - 15 converter having a first terminal connected to said subscriber line and a second terminal connected to the subscriber-associated local wiring; said subscriber converter comprising an xDSL analog front end (AFE) module connected to said first terminal, an HPN AFE module connected to said second terminal, a digital xDSL-to-HPN converter module connected to the xDSL AFE and to the HPN
  - 20 AFE and comprising a splitter-isolator module connected to both the first and the second terminals permitting passage therethrough of low-frequency, plain old telephone service (POTS) related signals while not permitting passage therethrough of xDSL and HPN signals.
2. A system according to Claim 1, wherein said group of SP's and said local
- 25 box are all included within one building.
3. A system according to Claim 1, wherein said subscriber-associated local wiring comprises a flat pair cable.

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4. A system according to Claim 1, wherein the terminal devices are selected from the group consisting of personal computer (PC), video device, television set, videophone, IP-phone, HI-FI audio devices.

5. A system according to Claim 1, wherein said HPN unit is an HPNA-2 interface unit and said subscriber converter comprises an ADSL AFE module connected said first terminal, an HPNA-2 AFE module connected to said second terminal, a digital ADSL-to-HPNA-2 converter module connected to the ADSL AFE and to the HPNA-2 AFE and comprising a splitter-isolator module connected to both the first and the second terminals permitting passage therethrough of low-frequency, plain old telephone service (POTS) related signals while not permitting passage therethrough of ADSL and HPNA-2 signals.

6. A system according to Claim 1, wherein:

- said xDSL modems in the CO are VDSL modems;
- the HPN unit is an HPNA-3 interface unit; and
- 15 - said SP comprises a VDSL AFE module connected to said first terminal, an HPNA-3 AFE module connected to said second terminal, a digital VDSL-to-HPNA-3 converter module connected to the VDSL AFE and to the HPNA-3 AFE and comprising a splitter-isolator module connected to both the first and the second terminals permitting passage therethrough of low-frequency, POTS-related signals while not permitting passage therethrough of VDSL and HPNA-3 signals.

7. A system according to Claim 1, wherein one or more of said subscriber converters are associated with a server computer, which is coupled to said xDSL-to-HPN converter module.

25 8. A system according to Claim 7, wherein said server computer has or is linked to one or more digital ports for coupling to accessory devices or terminal devices within the SP.

9. A system according to Claim 1, wherein the digital xDSL-to-HPN converter comprises:

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- a first digital signal processor (DSP) for conversion of xDSL signals to digital data packets and for conversion of digital data packets to xDSL signals, coupled to the xDSL AFE, to a first program memory and to a read and write memory (RAM);
  - 5 - a second DSP for conversion of digital data packets to HPN signals and for conversion of HPN signals to digital data packets, coupled to the HPN AFE, to a second program memory and to a RAM;
  - a data exchange controller coupled to the RAM, to said first DSP and to said second DSP for exchanging data between the two DSPs and between the
  - 10 DSPs and the RAM; and
  - a control processor coupled to said first DSP, to said second DSP and to said data exchange controller.
10. A system according to Claim 9, wherein said control processor is coupled to a digital port for connection to one or more external devices.
- 15 11. A system according to Claim 10, wherein the external device is a computer.
12. A system according to Claim 8, comprising a video server connected to said digital port, for downloading video films or broadcast transmitted from the CO through said subscriber line and said subscriber converter and for
- 20 transmission of downloaded Video films or broadcast to the subscriber converter through said subscriber converter.
13. A system according to Claim 12, wherein said video server can download video films or broadcast simultaneously through a plurality of subscriber converters, being those not in current use by the respective subscribers.
- 25 14. A system according to Claim 12, wherein said video server comprises a large memory for storage of video files and one or more data exchange modules for data exchange with the subscriber converters.
15. A system according to Claim 12, wherein said video server is linked to a data receiving system selected from the group consisting of satellite broadcast

receiving system, cable TV receiver equipment and terminal receiver device for an optical fiber.

16. A local network comprising:

- a group of one or more subscriber premises (SPs), each equipped with one or more telephone devices connected to a telephone line of the SP and one or more terminal devices, which can send or receive data over communication lines, the devices being connected to said telephone line by an HPN interface unit;
- one or more local communication boxes linked to SPs of the group by local wirings and linked to a central office of communication service provider by twisted pair subscriber telephone lines, comprising one for each SP of the group;
- at least one subscriber converter included within the local box, each of which is associated with one SP that is connected to said box, the subscriber converter having a first terminal connected to the subscriber line and a second terminal connected to the subscriber-associated local wiring; the subscriber converter comprising an xDSL analog front end (AFE) module connected to said first terminal, an HPN AFE module connected to said second terminal, a digital xDSL-to-HPN converter module connected to the xDSL AFE and to the HPN AFE and comprising a splitter-isolator module connected to both the first and the second terminals permitting passage therethrough of low-frequency, POTS-related signals while not permitting passage therethrough of xDSL and HPN signals.

17. A network according to Claim 16, wherein said group of SPs is all included within one building.

18. A system according to Claim 16, wherein said subscriber-associated local wiring comprises a flat pair cable.

19. A network according to Claim 16, wherein said HPN unit is an HPNA-2 interface unit and said SP comprises an ADSL AFE module connected said first terminal, an HPNA-2 AFE module connected to said second terminal, a digital ADSL-to-HPNA-2 converter module connected to the ADSL AFE and to the HPNA-2 AFE and comprising a splitter-isolator module connected to both the

first and the second terminals permitting passage therethrough of low-frequency, POTS-related signals while not permitting passage therethrough of ADSL and HPNA-2 signals.

20. A network according to Claim 16, wherein:

- 5 - the HPN unit is an HPNA-3 interface unit; and
- said SP comprises a VDSL AFE module connected to said first terminal, an HPNA-3 AFE module connected to said second terminal, a digital VDSL-to-HPNA-3 converter module connected to the VDSL AFE and to the HPNA-3 AFE and comprising a splitter-isolator module connected to both the
- 10 first and the second terminals permitting passage therethrough of low-frequency, POTS-related signals while not permitting passage therethrough of VDSL and HPNA-3 signals.

21. A network according to Claim 16, wherein one or more of said subscriber converters are associated with a server computer, which is coupled to said

15 xDSL-to-HPN converter module.

22. A network according to Claim 21, wherein said server computer has or is linked to one or more digital ports for coupling to accessory devices or terminal devices within the SP.

23. A network according to Claim 16, wherein the digital xDSL-to-HPN

20 converter comprises:

- a first digital signal processor (DSP) for conversion of xDSL signals to digital data packets and for conversion of digital data packets to xDSL signals, coupled to the xDSL AFE, to a first program memory and to a read and write memory (RAM);
- 25 - a second DSP for conversion of digital data packets to HPN signals and for conversion of HPN signals to digital data packets, coupled to the HPN AFE, to a second program memory and to a RAM;
- a data exchange controller coupled to the RAM, to said first DSP and to said second DSP for exchanging data between the two DSPs and between the
- 30 DSPs and the RAM; and

- a control processor coupled to said first DSP, to said second DSP and to said data exchange controller.

24. A network according to Claim 23, wherein said control processor is coupled to a digital port for connection to one or more external devices.

5 25. A network according to Claim 24, wherein the external device is a computer.

26. A network according to Claim 22, comprising a video server connected to said digital port, for downloading video films or broadcast transmitted from the CO through said subscriber line and said subscriber converter and for  
10 transmission of downloaded Video films or broadcast to the SP through said subscriber converter.

27. A network according to Claim 26, wherein said video server can download video films or broadcast simultaneously through a plurality of subscriber converters, being those not in current use by the respective subscribers.

15 28. A network according to Claim 26, wherein said video server comprises a large memory for storage of video files and one or more data exchange modules for data exchange with the subscriber converters.

29. A network according to Claim 26, wherein said video server is linked to a data receiving system selected from the group consisting of satellite broadcast  
20 receiving system, cable TV receiver equipment and terminal receiver device for an optical fiber.

30. A subscriber converter device comprising:

- a first terminal for connection to a subscriber line, which comprises a twisted pair cable linking the subscriber converter to a central office of a  
25 communication service provide;
- a second terminal for connection to a subscriber-associated local wiring linking the subscriber converter to a subscriber premise (SP).
- an xDSL analog front end (AFE) module connected to said first terminal;
- an HPN AFE module connected to said second terminal;

- a digital xDSL-to-HPN converter module connected to the xDSL AFE and to the HPN AFE; and

- a splitter-isolator module connected to both the first and the second terminals permitting passage therethrough of low-frequency, POTS-related signals while not permitting passage therethrough of xDSL and HPN signals.

31. A subscriber converter according to Claim 30, wherein:

- an ADSL AFE module is connected said first terminal;

- an HPNA-2 AFE module is connected to said second terminal;

- a digital ADSL-to-HPNA-2 converter module is connected to the ADSL AFE and to the HPNA-2 AFE; and

- a splitter-isolator module is connected to both the first and the second terminals permitting passage therethrough of low-frequency, POTS-related signals while not permitting passage therethrough of ADSL and HPNA-2 signals.

32. A system according to Claim 30, wherein:

(a) an VDSL AFE module is connected said first terminal;

(b) an HPNA-3 AFE module is connected to said second terminal;

(c) a digital VDSL-to-HPNA-3 converter module is connected to the VDSL AFE and to the HPNA-3 AFE; and

- a splitter-isolator module is connected to both the first and the second terminals permitting passage therethrough of low-frequency, POTS-related signals while not permitting passage therethrough of VDSL and HPNA-3 signals.

33. A subscriber converter according to Claim 30, being associated or being connectable to a server computer.

34. A subscriber converter according to Claim 30, wherein the digital xDSL-to-HPN converter comprises:

- a first digital signal processor (DSP) for conversion of xDSL signals to digital data packets and for conversion of digital data packets to xDSL signals, coupled to the xDSL AFE, to a first program memory and to a read and write memory (RAM);

35. A system according to Claim 9, wherein said control processor is coupled  
10 to a digital port for connection to one or more external devices.